THE DESIGN OF A NEW SIGNAL PROCESSING SUBSYSTEM FOR THE WSR-88D (NEXRAD) RADAR

A PROJECT LEADING TO .....

REPLACEMENT OF THE SIGNAL PROCESSING SUBSYSTEM (SPS) AND THE STATUS AND CONTROL COMPUTER (RDASC) IN THE WSR-88D RADAR DATA ACQUISITION (RDA) FUNCTIONAL AREA

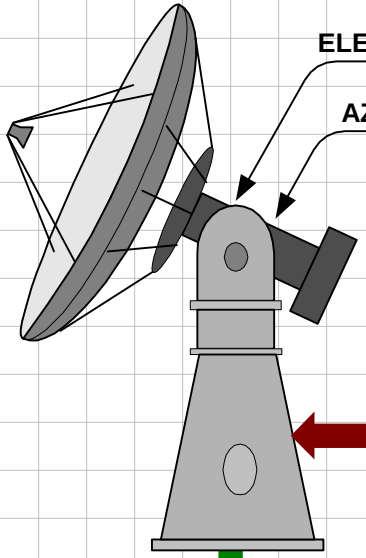
A PREREQUISITE FOR .....

- NEW FEATURES, I.E. POLARIMETRY
- PERFORMANCE ENHANCEMENT
- REDUCING IMPACT OF OBSOLESCENCE

CHARACTERISTICS .....

- MODULAR
- SCALEABLE
- OPEN SYSTEM STANDARDS
- COTS

EXISTING RDA CONFIGURATION .....



ELEVATION

AZIMUTH

ANTENNA PEDESTAL CONTROL

MAN-MACHINE INTERFACE (MMI)

TRANSMITTER

EQUIPMENT SENSORS AND INTERLOCKS

RECEIVER

RF SOURCE

DATA ACQUISITION UNIT

RPG

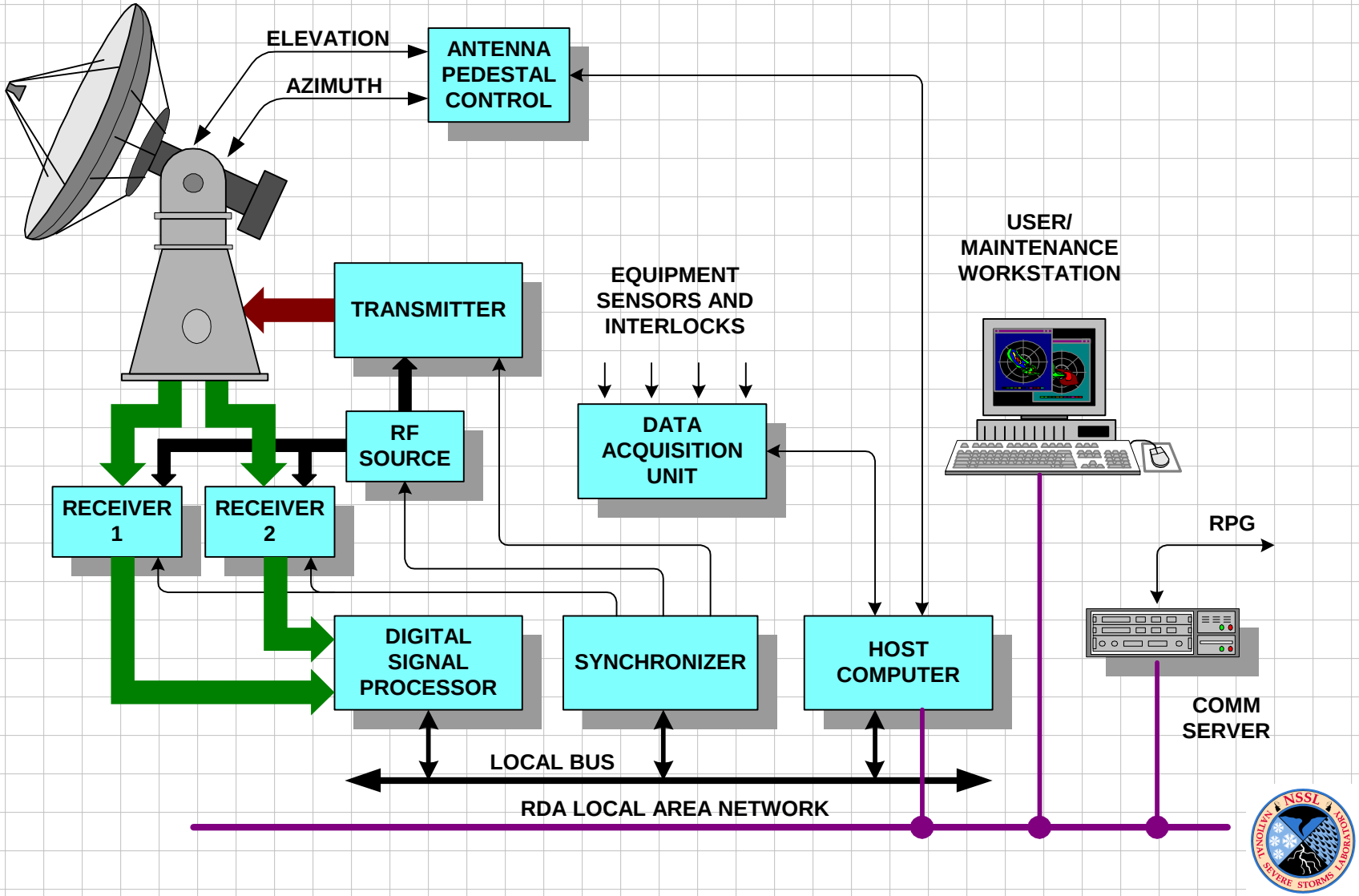
HARDWIRED SIGNAL PROCESSOR

PROGRAMMABLE SIGNAL PROCESSOR

RDA STATUS AND CONTROL COMPUTER

VME COMMUNICATION CHASSIS

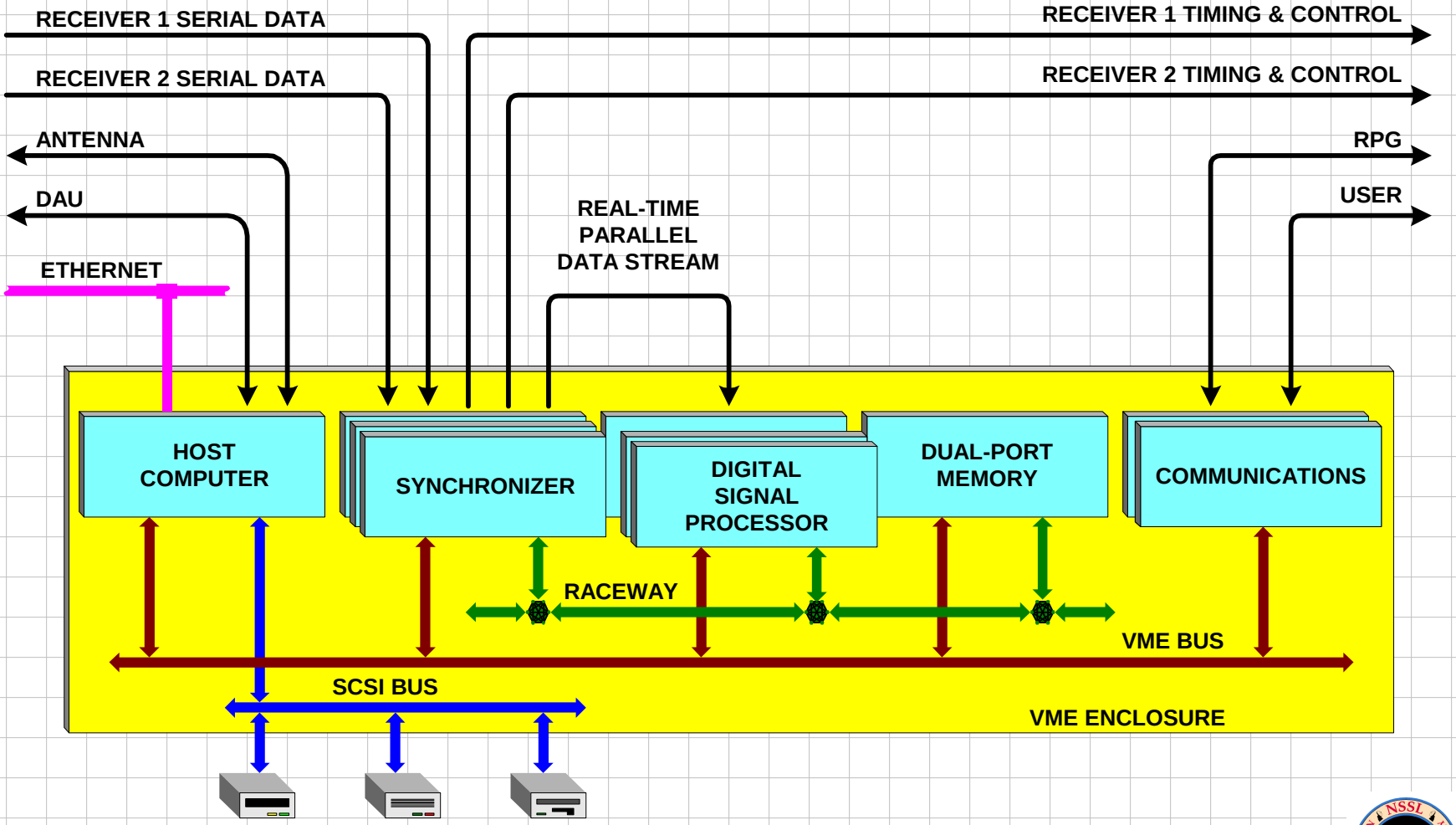
PROPOSED RDA CONFIGURATION .....



PROTOTYPE CHARACTERISTICS .....

- STANDARD VME-64 ARCHITECTURE
- STANDARD 6U FORM FACTOR
- INTEGRATED COTS SINGLE BOARD HOST COMPUTER
- INTEGRATED COTS SIGNAL PROCESSOR SUBSYSTEM
- CUSTOM IN-HOUSE DESIGNED SYNCHRONIZER AND CONTROL SUBSYSTEM
- MULTI-TASKING POSIX COMPLIANT REAL-TIME OPERATING SYSTEM

HARDWARE PLATFORM .....

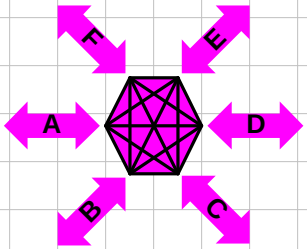


DIGITAL SIGNAL PROCESSOR .....

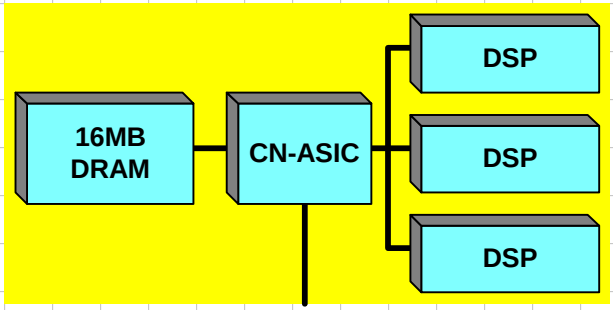
- HETEROGENEOUS MULTICOMPUTER SYSTEM DEVELOPED BY MERCURY COMPUTER SYSTEMS INC.
- BASED ON INDUSTRY STANDARD RACEWAY SWITCHED INTERCONNECT FABRIC
- USING FAST 6-PORT CROSSBAR SWITCH TECHNOLOGY
- FEATURES EXTREMELY HIGH BANDWIDTH DATA TRANSFER
- USES SUPER HARVARD ARCHITECTURE (SHARC) DSP FROM ANALOG DEVICES
- EASILY EXPANDABLE TO SEVERAL HUNDRED PROCESSORS

SIGNAL PROCESSOR COMPONENTS .....

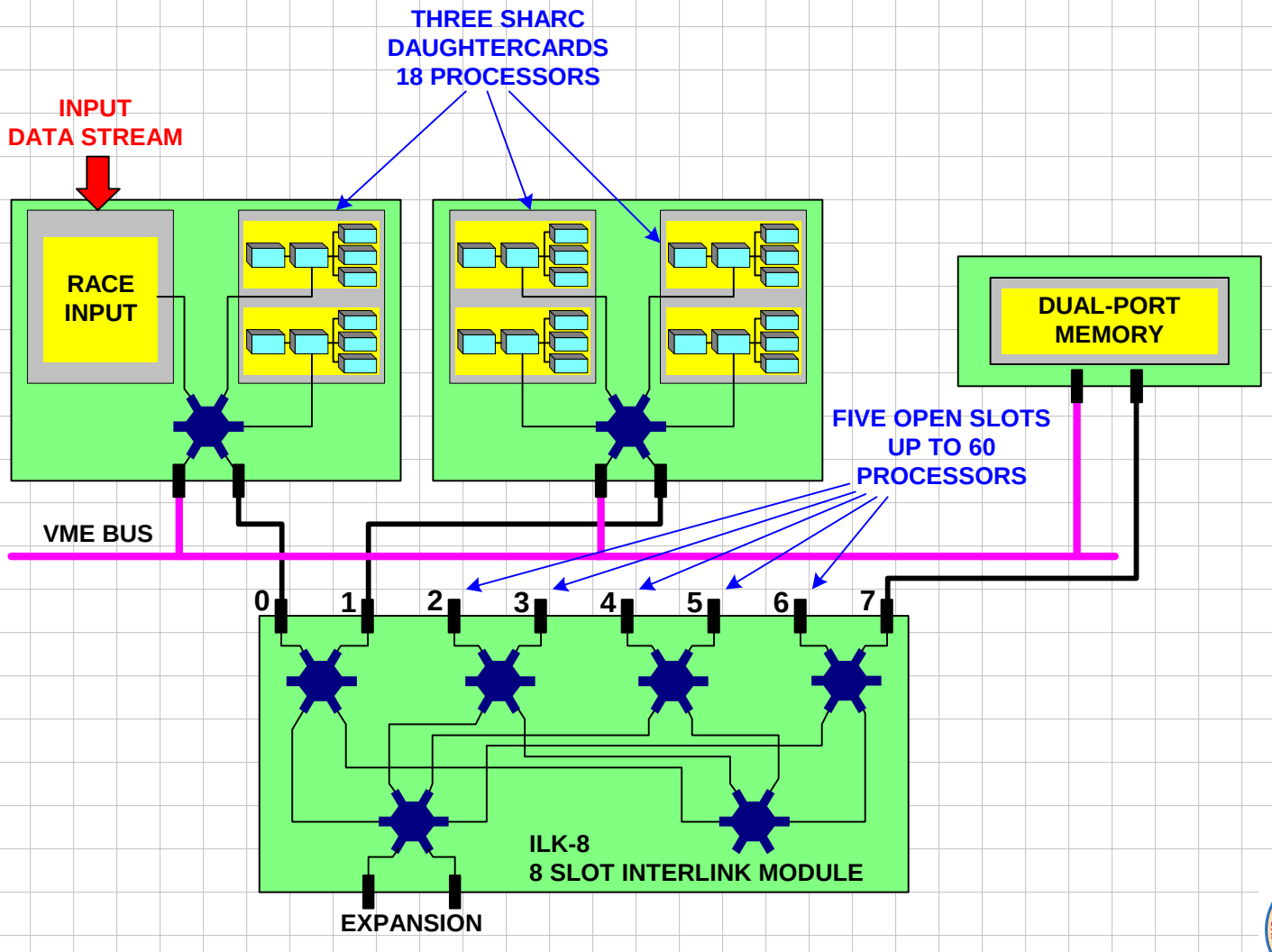
HIGH-SPEED 6-PORT CROSSBAR SWITCH ALLOWS MULTIPLE TRANSACTIONS WITH MINIMUM LATENCY



HETEROGENEOUS COMPUTE NODES CAN BE DIFFERENT TYPES OF PROCESSOR, MEMORY OR I/O PORTS

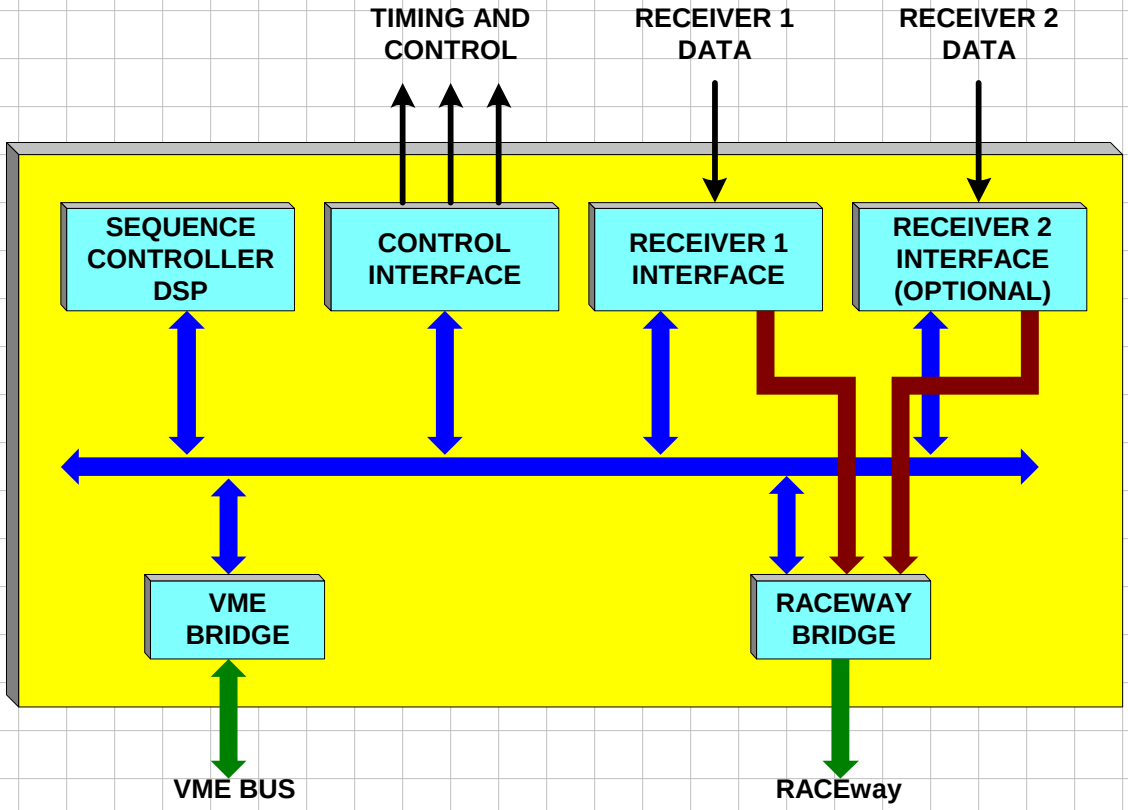


HARDWARE CONFIGURATION .....



RADAR TIMING AND CONTROL .....

CUSTOM DESIGNED SYNCHRONIZER BASED ON A HIGH-SPEED PROGRAMMABLE SEQUENCER



DEVELOPMENT ENVIRONMENT .....

DISTRIBUTED DEVELOPMENT AND TESTING USING ACTUAL TARGET PLATFORMS